IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Frank C. Smith, Jr. Application No.: 10/701,146 Filed: 11/4/2003 Title: Cargo Oriented Aircraft Attorney Docket No.: 50121	Art Unit: 3644 Examiner: Tien Dinh

Commissioner for Patents
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APPEAL BRIEF

Real Party in Interest

The party named in the caption of the brief is the real party in interest.

Related Appeals and Interferences

There are no appeals or interferences related to, or that will directly affect or be directly affected by, the Board's decision in the pending appeal, to Applicant's knowledge.

Status of Claims

Claims 1-11 are pending. Claims 1-11 are appealed.

Status of Amendments

All amendments have been entered.

Summary of Invention

Background. The instant inventor regularly flew a Piper Cherokee Six across the country. The constant problem was transportation upon arrival. It is difficult to rent a car or to secure taxi service at private airports. Private pilots rent cars from airport managers, if possible, or locals are requested to pick them up. The instant inventor, upon occasion, carried a bicycle or a small scooter.

The ground transportation problem was perplexing because there was room in a Cherokee Six for a 600 pound motorcycle, by volume and by weight. (Spec, page 1, lines 10-12.) However, there was no way to get the motorcycle in. (Spec page 1, lines 12-13.) (Of course, a small car would be preferable, given an aircraft with a somewhat higher weight and volume accommodation limit than a Cherokee Six.) (Spec. page 1 lines 10-11)

One day a cost-effective solution occurred to the inventor – combine a rear door entry with a two surface canard. A rear fuselage door would permit loading bulky items. (Spec. page 1, line 15-16.) However, the rear fuselage door designs traditional in the industry utilize a "boom supported" empennage, or the like, like references Read and Weaver, (Spec page 1 lines 24-26; page 32, line 7; page 3 line 9-11). Boom supported empennages add too much weight, drag, expense and complexity to be practical. (Spec. page 4 line 18.) But, an unconventional "two-surface canard" design could offer a simple, elegant and cost effective solution to the problem of adding a rear door. (See page 4, line 20) The instant inventor perceived that the overall advantages of the novel design, i.e. cost effective rear loading, would outweigh any relative disadvantage of a canard control surface design vis-à-vis a traditional empennage control surface design. (Spec page 2 lines 15-17.) This is an instance of "thinking outside the box."

Although canard control surfaces have long been known (Wright Bros. first plane,) the consensus has long been that their disadvantages outweigh their advantages, vis a vis an empennage design. See for instance Rutan '245 column 2 line 27 through column 3 line 4 for the advantages of a canard and column 3 line 5 through line 17 for the disadvantages of a canard. See Sutton column 1 lines 29 through 36 for the disadvantages of a canard. Since the net advantages of an empennage located control surface have generally been considered to outweigh any advantages of a canard design, a canard is an oddity. The canard control surface is rarely seen. Its utilization has been limited to experimental aircraft and designs that place an extreme priority on maximizing fuel efficiency, such as the Voyager craft.

The instant inventor appreciated, however, based upon a fortuitous combination of aeronautical training[1] and experience[2], that the competition between a canard control surface design and an empennage based control surface design could actually be close. In the instant case, for a rear loading craft, the lack of cost effectiveness for an empennage design solution still leaves the canard design as a practical and feasible solution.

In sum, a canard design offers cost-effective advantages of simplicity, lower drag, lower weight and less cost, vis-a-vis a boom supported empennage design, and it is viable. A Cherokee Six sized aircraft, for instance, could load and unload a motorcycle, wheel chair, gurney, coffin,

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[1] The instant inventor has an aeronautical engineering degree from Cal Tech.

[2] The instant inventor has lifetime experiences that include flying a model canard, constructing a Burt Rutan experimental canard craft, accompanying Mr. Rutan flying an experimental canard, and being one of the "contributors" to the Burt Rutan Voyager project. (The Voyager was a canard design that set a world record by flying nonstop around the world without refueling.) Importantly, the instant inventor also

etc. (Spec. page 5, line 1-2) through a rear door while a canard control surface design could cost effectively replace the empennage control surface system without adding the impractical complexity, drag and expense of a boom supported empennage. (Spec. page 2 lines 10-12) The advantage of a rear door loading craft outweighs the perceived relative disadvantage of a canard design versus an empennage control system. Calculations confirm that the center of gravity, center of lift and pitch and yaw control can be cost effectively managed. (Spec. page 2, lines 13-15.) Thus, a fortuitous coincidence of long felt need for a cost effective rear loading cargo-oriented aircraft together with aeronautical engineering training and an acquaintanceship with canards led the instant inventor to the novel conception of this unique cargo-oriented, cost effective aircraft, being a rear loading canard, a design which optimizes the weight and volume carrying capacity of a craft by providing for the loading of bulky items.

Issues

Issue I Whether the phrase "only two significant horizontal surfaces," claim 1, line 2, is vague and indefinite under §112, second paragraph.

Issue II Whether the phrase "door type of closure" in claim 1, last line, is vague and indefinite under §112.

Issue III Whether claims 1-6, 8, 9, 10 and 11 are unpatentable under §103 over Sutton in view of Weaver and Rutan.

Grouping of Claims

For the first two grounds of rejection under §112, claims 1-11 do not stand or fall together. Claims 1-10 will stand or fall together. Claim 11 will be argued separately for each ground.

In regard to the rejection under §103, claims 1-11 do not stand or fall together. Independent claims 1 and 11 will each be argued separately, in part. Dependent claims 5 and 6 will each be argued separately, in part.

Argument

Issue I Whether the phrase "only two significant horizontal surfaces," claim 1, line 2, is vague and indefinite under §112, second paragraph.

Claim 11 Claims 1 and 11 are independent. Claims 2-10 depend on claim 1. Claim 11 is argued separately in regard to this ground of rejection. The Examiner asserts that the phrase "only

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knew from a unique experience that a single tractor engine had been tested with a canard design and had performed satisfactorily.)

two significant horizontal surfaces" in claim 1, line 2, is vague and indefinite. That phrase does not occur in independent claim 11. Without more, claim 11 is allowable in regard to this §112 rejection.

(However, in the Response to Arguments section the Examiner suggested, in contrast to what was explicitly stated, that it might be only the term "significant" that was regarded as "vague and indefinite." Since the word "significant" does occur in claim 11, line 2, to the extent that the Examiner's rejection is to the use of the word "significant" alone, applicant's argument in regard to claim 1 will also apply to claim 11.)

Claim 1 MPEP §2173.05(b) Relative Terminology states that:

> "The fact that claim language, including terms of degree, may not be precise, does not automatically render the claim indefinite under 35 U.S.C. 112, second paragraph. *Seattle Box Co., v. Industrial Crate and Packing, Inc.*, 731 F.2d818,221 USPQ 568 (Fed. Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, **in light of the specification.**

Applicant directs attention to page 2, lines 29-32, of the Written Description. Herein is found context and support for the meaning of "two and only two significant horizontal lifting surfaces."

> The instant invention further specifies two and only two significant horizontal lifting surfaces, with the smaller in front of the larger, e.g. a "two surface" canard, together with an opening at the rear fuselage through which large objects (relatively speaking) can be loaded.

See also page 4 lines 29 - page 5 line 3:

> "A "canard" is sometimes referred to as a "tail-first" aircraft. The term "two-surface" canard is used herein to refer to an aircraft having two, and only two, significant (i.e. non trivial, non de minimus) horizontal lifting surfaces (independent of the fuselage and any booms, to the extent they could be said to offer a lifting surface,) with the smaller lifting surface (the canard surface) in front (of the wing). (Herein, left and right wings divided by a fuselage are referred to as one horizontal lifting surface. Similarly, left and right canard surfaces will be regarded as a single horizontal lifting surface for purpose of discussion and description herein.)"

Applicant further directs attention to an amendment added to the last paragraph to page 6 of the specification, incorporating materials from the original claims:

> "In the following claims, when discussing a canard having two and only two significant lifting surfaces, with a smaller lifting surface in front of a larger lifting surface, it should be understood that the smaller lifting surface is usually and frequently referred to as a 'canard surface'. The larger lifting surface is usually and frequently referred to as a 'wing.'"

Applicant submits that in light of the Written Description, one of ordinary skill in the art understands what claimed by "two and only two significant horizontal lifting surfaces."

In the Response made final, Response to Argument Section, the Examiner appeared to take exception only to the single word "significant." The Examiner stated:

> "The Examiner still maintains that the term 'significant' in claim 1 is vague and indefinite. What qualify this as 'significant?'" See page 3 of Action made final.

In this regard Applicant directs attention to lines 30 and 31 of page 4 wherein the word "significant" is followed by the phrase "(i.e. non trivial, non de minimus)." One of ordinary skill in the art would understand what is claimed by "significant" horizontal lifting surface. The claims are sufficiently definite, it is submitted.

Issue II Whether "door type of closure" in claim 1, last line, is vague and indefinite under §112.

Claim 11. Claim 11 is argued separately. The phrase "door type of closure" does not occur in independent claim 11. Claim 11 is allowable thus without more over this ground of objection.

Claim 1. In regard to claims 1-10, the Examiner, asserts:

> "Please note that 'type' is considered to be indefinite."
> See MPEP 2173.05(b)E.

Applicant submits that given the test of **MPEP §2173.05(b) Relative Terminology** stated above, terms of degree, including the term "type," are not per se indefinite. The test is whether one of ordinary skill in the art would understand what is claimed in light of the specification.

In the specification doors and door types of closure are discussed on page 5, line 4 through 7 and line 29 through 31 and on page 6, line 5 through 16. In light of that

discussion, "door type of closure" would be understood by those of ordinary skill in the art and would not be impermissibly vague and indefinite.

More particularly under **§2173.05(b) Relative Terminology,** there is a subsection discussing the word "type." The addition of the word "type" to an otherwise definite expression can impermissibly extend the scope of the expression as to render it indefinite if it is unclear what "type" was intended to convey. Such is not the case here. "A door type of closure" is definite, grammatically correct and clear. The claim recites that the opening has "a door type of closure" for flight. Said otherwise, the opening has a closure, of "a door type" rather than a permanently sealed type, for instance, such as a welded shut closure.

Conclusion in regard to §112 Issues. In regard to both Issues above under section §112, second paragraph, the original claims use terms utilized in the Written Description. The phrases, in light of the specification, are not vague and indefinite. They would be understood by one of ordinary skill in the art. Neither the word "type" nor the word "significant" are per se vague and indefinite. (A search revealed that both words are frequently used in claims. The Patent Office database of patents from 1976 to the present indicated over 200,000 patents using the word "type" in the claims and about 20,000 patents using the word "significant" in the claims.)

Issue III Whether claims 1-6, 8, 9, 10 and 11 are unpatentable over Sutton in view of Weaver and Rutan, under §103.

Claims 5, 6 and 11 will be argued separately, in part, from claim 1 in regard to this Issue. Claim 7 will stand and fall with claim 1.

Re All Claims: As a preliminary matter, Applicant submits that Sutton (a "flying wing") provides an improper primary reference. Only a single word from independent claim 1, the word "aircraft," is readable upon primary reference Sutton. Only four words of independent claim 11 read on Sutton, the word "aircraft" and the phrase "having no empennage." Applicant submits that it is improper to selectively choose elements from two references and then add them to what amounts to a "blank slate" primary reference, when viewed in reference to the instant invention. E.g. Sutton offers something like a bulletin board, to which the examiner finds elements in various reference and pins them on.

Note that the Examiner does not assert a direct combination of secondary references Rutan and Weaver. See the top of page 5 in the second Action where the Examiner expressly asserts that he is modifying the Sutton reference, not the Rutan or Weaver references.

The impropriety of Sutton as a primary reference is more pronounced with respect to claim 1 than claim 11. Hence, each claim should be judged by itself in this regard.

All Claims:

Lack of motivation. The Examiner in a conclusory fashion asserts a motive to combine Rutan's canard with Sutton's flying wing, namely, "to increase maneuverability." This asserted motive for selectively combining just a canard from Rutan to Sutton's "flying wing" is without justification in the references themselves or from any asserted common knowledge. The Examiner offers no justification or basis for the assertion.

In particular, the Examiner gives no basis for his assertion why, or how, selectively "adding Rutan's canard to Sutton's [flying wing] design" would "increase maneuverability." There is no explanation as to why Sutton's design needs "increased maneuverability." Sutton reflects no such need. More importantly, there is no explanation of why one would look to "Rutan's canard" to "increase maneuverability," were Sutton to need such. Sutton himself proposes a different solution to his "diving" problem occasioned by the high lift flaps on his flying wing.

Sutton solves his diving problem with the inventive addition of "extendable retractable balancing elements A." Adding Rutan's "secondary wing system useable for aircraft" to Sutton's design would be redundant, and it would likely destroy Sutton's invention, undoing the balancing of forces achieved by Sutton's inventive "extendable retractable balancing elements A."

Applicant submits that the Examiner's asserted motive is based on hindsight, without substantiation and destroys Sutton's invention. Absent motive to make the Examiner's selective combination, claims 1-11 are not obvious. Applicant submits that there exists no motive, absent hindsight, to selectively and particularly select Rutan's canard surface and add it to Sutton's flying wing. (Sutton himself appears familiar with the notion of a forward control surface, see Sutton, col 1 lines 29-36, and yet does not advise or teach such a combination.)

Claims 5 and 6

None of the references teach or suggest that their inventions have application to "personal air craft" (claim 6), much less a "light personal aircraft" (claim 5.) The Examiner done not so assert and thus fails to make a *prima face* case in regard to claims 5 and 6. The definition of "personal aircraft" and "light personal aircraft"" are found in the Specification on page 5, lines 8-11.

Respectfully Submitted,

12/1/14
Date

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APPENDIX A

What is claimed is:

1. A cargo adapted aircraft, comprising:

   a canard having two and only two significant horizontal lifting surfaces, with a smaller lifting surface in front of a larger lifting surface; and

   a large opening at the rear of the fuselage through which objects can be loaded, the opening having a door type of closure for flight.

2. The aircraft of claim 1 including yaw control surfaces on the wing.
3. The aircraft of claim 1 having no empennage.
4. The aircraft of claim 2 having no empennage.
5. The aircraft of claims 1, 2, 3 or 4 wherein the aircraft is a light personal aircraft.
6. The aircraft of claims 1, 2, 3 or 4 wherein the aircraft is a personal aircraft.
7. The aircraft of claims 1, 2, 3 or 4 that includes one tractor engine.
8. The aircraft of claims 1, 2, 3 or 4 that includes two wing located engines.
9. The aircraft of claims 1 or 2 without a boom-supported empennage.
10. The aircraft of claims 1 or 2 including a pitch control surface on the smaller horizontal lifting surfaces.
11. A cargo-adapted personal aircraft, comprising:

    a canard having two significant horizontal lifting surfaces with a smaller lifting surface in front of a larger lifting surface;

    a large opening at the rear of the fuselage through which objects can be loaded; and

    having no empennage.